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Research Article

Evaluation of fibromyalgia in on-call healthcare workers

Nöbet tutan sağlık çalışanlarında fibromiyaljinin değerlendirilmesi

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Abstract

Introduction: Fibromyalgia (FM) is a non-articular, chronic rheumatic disease with unknown etiology, characterized by widespread musculoskeletal pain, sleep disorder, fatigue, and the presence of numerous tender points. Working with the shift work and night shift system contradicts the normal biological rhythm of the body and negatively affects the person in many ways. The complaint of sleep disorder is widespread in patients with FM; close to 100% prevalence has been reported in some studies. This study aimed to investigate the relationship between fibromyalgia and shift working order in our hospital staff.

Methods: This cross-sectional study was conducted in our university hospital. 120 people who met the inclusion criteria were included in the study, and 80 were accepted. As a control group, 95 people were reached, 80 of whom agreed to participate in the study. The Fibromyalgia Impact Scale (FES) was questioned in cases with fibromyalgia. The SF-36 quality of life questionnaire was applied to all the cases in which the study was conducted. 1990 ACR Fibromyalgia Diagnostic Criteria were used for diagnosis. The Fibromyalgia Impact Scale (FES) was questioned in cases with FM.

Results: The average score of all SF-36 quality of life questionnaire sub-field groups was significantly higher in the control group than in the group who stand duty ($p < 0.05$). There is a difference between the study group and the control group in terms of "physical function" ($p<0.001$). The "physical function" score is higher in the control group. A significant difference was found in SF-36 subgroups in cases with FM (N:39) compared to cases with non-FM (N:141) ($p<0.05$). General health status was more negatively affected in the cases with FM. There is a weakly positive linear relationship (borderline significant) between FES1.2 (laundry) and "social function" ($r=0.349$, $p=0.054$). There is a moderately negative linear relationship between FES1.3 (preparing meals) and “general health” ($r=-0.420$, $p=0.019$)

Conclusion: As a result, fibromyalgia is more common in health workers who are working night shifts and have at least four night shifts a month. This situation negatively affects health workers' quality of life and general health. the number and intensity of night shifts per person should be minimized as much as possible to reduce the potential negative impact of night shifts on workers, especially in the lines of work where a shift work order negatively affects the human biological clock.

Keywords: Fibromyalgia; shift work schedule; musculoskeletal pain; quality of life, biological clocks

Öz

Giriş: Fibromiyalji (FM), yaygın kas-iskelet sistemi ağrısı, uyku bozukluğu, yorgunluk ve çok sayıda hassas noktanın varlığı ile karakterize, etiyolojisi bilinmeyen, eklem dışı, kronik bir romatizmal hastalıktır. Vardiyalı çalışma ve gece vardiyası sistemi ile çalışmak vücudun normal biyolojik ritmine aykırıdır ve kişiyi birçok yönden olumsuz etkiler. FM'li hastalarda uyku bozukluğu şikayeti oldukça yaygındır; Bazı çalışmalarda %100'e yakın yaygınlık rapor edilmiştir. Bu çalışmada hastanemiz personelinin fibromiyalji ile vardiyalı çalışma düzeni arasındaki ilişkinin araştırılması amaçlandı.

Yöntem: Kesitsel tipte olan bu çalışma üniversite hastanemizde gerçekleştirildi. Araştırmaya dahil edilme kriterlerini karşılayan 120 kişiden 80 kişi kabul edildi. Kontrol grubu olarak 95 kişiye ulaşıldı ve bunların 80'i çalışmaya katılmayı kabul etti Fibromiyaljili olgularda Fibromiyalji Etki Ölçeği (FES) sorgulandı. Çalışmaya katılan tüm olgulara SF-36 yaşam kalitesi anketi uygulandı. Tanı için 1990 ACR Fibromiyalji Tanı Kriterleri kullanıldı. FM'li olgularda Fibromiyalji Etki Ölçeği (FES) sorgulandı.

Bulgular: Tüm SF-36 yaşam kalitesi anketi alt alan gruplarının ortalama puanı, çalışma grubunda kontrol grubunda görev yapan gruba göre anlamlı derecede yüksekti ($p<0,05$). Çalışma grubu ile kontrol grubu arasında "fiziksel fonksiyon" açısından fark vardı ($p<0,001$). Kontrol grubunda "fiziksel fonksiyon" puanı daha yüksekti. FM'li olgularda (N:39) SF-36 alt gruplarında FM olmayan olgulara (n:141) göre anlamlı fark bulundu ($p<0,05$). FM'li olgularda genel sağlık durumunun daha olumsuz etkilendiği saptandı. FES1.2 (çamaşır yıkama) ile “sosyal işlev” ($r=0,349$, $p=0,054$) arasında zayıf derecede pozitif doğrusal bir ilişki bulundu (sınırda anlamlı). FES1.3 (yemek hazırlama) ile “genel sağlık” arasında orta derecede negatif doğrusal ilişki saptandı ($r=-0,420$, $p=0,019$).

Sonuç: Gece vardiyasında çalışan ve ayda en az dört nöbet tutan sağlık çalışanlarında fibromiyalji daha sık görülmektedir. Bu durum sağlık çalışanlarının yaşam kalitesini ve genel sağlığını olumsuz yönde etkilemektedir. Özellikle vardiyalı çalışma düzeninin insanın biyolojik saatini olumsuz etkilediği iş kollarında, gece vardiyalarının işçiler üzerindeki olası olumsuz etkisini azaltmak için kişi başına düşen gece nöbeti sayısı ve yoğunluğu mümkün olduğunca en aza indirilmelidir.

Anahtar Kelimeler: Fibromiyalji; vardiyalı çalışma programı; kas-iskelet ağrısı; yaşam kalitesi, biyolojik saatler

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Key Points

1. Fibromyalgia is seen more frequently in healthcare workers who work night shifts and have at least 4-night shifts per month.
2. In people with circadian rhythm disorders, muscle pain increases

Introduction

Fibromyalgia (FM) is a non-articular, chronic rheumatic disease with unknown etiology, characterized by widespread musculoskeletal pain, sleep disorder, fatigue, and the presence of numerous tender points [1]. To diagnose FM, there must be widespread pain and tenderness at 11 or more of 18 specific points [2]. Although the prevalence of FM is high, there is little information about its epidemiological structure [1]. The global prevalence of fibromyalgia is estimated at 2.7% (4.2% female, 1.4% male), but studies have produced varying results [3]. 80-90% of patients are women, and it is frequently seen between the ages of 30-50 [4].

Among the patients admitted to primary health care institutions, individuals with symptoms of FM are not few. Algometry is an assessment tool that measures tenderness in kg by applying pressure to the skin. Using the Algometry device, the FM tender points can be detected objectively.

Today, according to the ACR 1990 criteria, versatile research and discussions on pathophysiological mechanisms in FM, which are very easy to diagnose, adaptable, and challenging to treat, have continued. The etiopathogenesis of FM is still unknown, but factors such as physical trauma, surgical intervention, infections, and acute or chronic emotional stress may play a triggering role [5]. To date, the studies' results that explain the physio-pathological mechanisms suggest that neuroendocrine and autonomic dysfunction in this syndrome is involved in pathogenesis and that genetically predisposed individuals are exposed to environmental, physiological, and psychological conditions stress, and FM develops [6].

As the causes of FM began to be investigated more extensively, the importance of sympathetic innervation, in short, of the vegetative nervous system, will be seen better. Neurovegetative system functions are associated with their participation in the reactions in the system as a result of adjustments between humoral, cellular, neural and hormonal regulatory mechanisms. Any defect in only one of these mechanisms will result in a functional disorder of the whole system. Without vegetative dysfunction, fibromyalgia syndrome is unlikely to occur. Eliminating the underlying sympathetic dysfunction, in other words, vegetative dysfunction, facilitates the resolution of FM [7].

The human organism has a pattern of being awake during the day and asleep during the night. This mechanism, which controls this cycle and is called circadian rhythm, is controlled by the biological clock located in the body and adjusted according to the 24-hour zone. Research on shift work and night shift systems reveals that this study adversely affects the physiological, psychological health, and social lives of healthcare workers [8]. Working with the shift work and night shift system contradicts the normal biological rhythm of the body and negatively affects the person in many ways.

In patients with FM, various findings such as muscular symptoms, cognitive complaints, depression, insomnia and fatigue that accompany chronic pain have been identified [9]. The complaint of sleep disorder is very common in patients with FM, close to 100% prevalence has been reported in some studies [10]. Sleep disorders are very common in these cases, but there is not enough information about their etiology. The aim of this study is to determine the frequency of fibromyalgia and to investigate the relationship between fibromyalgia and shifts in hospital staff members working night shifts.

Methods

This cross-sectional study was conducted in our university hospital between January and October 2018. Eighty volunteers from physicians, nurses, medical secretaries, civil servants, and nurses who stand duty at least four nights a month at the hospital were included in the study. The workers who were treated for pregnancy or malignancy or who were treated for psychosis were excluded from the study. One hundred twenty people who met the inclusion criteria in our study were reached, and 80 of them accepted to participate. As a control group, 80 people were caught, and 80 admitted to participating in the study. The SF-36 quality of life questionnaire was applied to all the cases who participated in the study [11]. SF-36 is a test of 36 substances that the patient/person themselves answers by filling in to find out about the person's condition. SF-36 provides the opportunity to evaluate the person's health status with eight sub-parameters. These parameters are vitality, physical function, pain, general health, physical function, emotional function, social function, and mental health. Participants were questioned whether there was pain or tenderness in the visual card-related areas with drawings showing FM tender points.

1990 ACR Fibromyalgia Diagnostic Criteria were used for diagnosis [12]. In accordance with these criteria, tender points were determined by applying four kg pressure with an algometry device. Afterward, the musculoskeletal examination of these cases for fibromyalgia was made, and the diagnosis of fibromyalgia was confirmed.

Fibromyalgia Impact Scale (FES) was questioned in cases with FM [13]. The obtained data were evaluated statistically by using SPSS 15.0 (SPSS Inc., Chicago, IL, USA) package program. Values below $p<0.05$ were considered statistically significant. Student's t-test and Pearson correlation test were used in independent groups.

Values for r:

0-0.10: Negligible
0.11-0.39: Weak
0.40-0.69: Moderate
0.70-0.89: Strongly
0.90-1.00: Very strong (excellent)

Ethical approval

For this research, the Ethics Committee approval was obtained from the Health Sciences Ethics Committee of our University School of Medicine (12/10/2016 dated 20.478.486.341 numbered), and then the research permit approval was obtained from the hospital's chief medical officer. An "informed consent" form was given to the volunteers who participated in the study, and their personal consent was obtained.

Statistical analysis

Study data was evaluated with SPSS 26 (SPSS Inc., Chicago, IL, USA) v26 statistical package program. In evaluating whether there is a difference in terms of scale scores between the study group and the control group, the sample size calculation was made by taking into account an effect size of 0.50, a power of 0.85, and a margin of error of 0.05. A total of at least 77 people were included in the study. It was determined that at least 154 people should be recruited. Sample size calculation was made with the G*Power 3.1.9.7 program.

The suitability of the numerical data in the study for normal distribution was evaluated with the Shapiro-Wilk test. Descriptive statistics are shown as mean ± standard deviation for variables with normal distribution, median (minimum-maximum) for variables with non-normal distribution, and number of people (n) and (%) for nominal variables. The study examined whether there were differences between groups in terms of continuous variables (age, years of education, number of people on duty) with the Student t Test/Mann Whitney U Test. Whether there was a difference between the groups in terms of scale scores was analyzed with the Mann-Whitney U Test. Nominal variables (gender, marital status, profession, whether or not they were on duty) were evaluated with Pearson chi-square / Fisher Exact Test. The Spearman Correlation Coefficient was used to examine the relationships between scale scores. Results for $p<0.05$ were considered statistically significant.

Results

120 people who met the inclusion criteria were reached, and 80 were accepted to participate in the study. 95 people were reached as a control group, and 80 were accepted to participate in the study.

In our study, there was no significant difference between the ones who stand duty [age (32.38± 5.42); female (68.8%), male (31.2%)] and controls [age (35.15 ± 7.0); female (56.2%), male (43.81%)]. The distribution of cases according to professions is seen in Table 1.

Table 1. Comparison of groups according to demographic variables

Variables	Study group (n=80)	Control group (n=80)	p-value
Gender*			
Male	25 (31.2%)	35 (43.8%)	0.102
Female	55 (68.8%)	45 (56.2%)	
Age**	32.38±5.42	35.15±7.00	**0.006**
Marital status*			
Married	45 (56.2%)	53 (66.2%)	0.194
Single	35 (43.8%)	27 (33.8%)	
Education duration (year)***	7.0 (3.0-10.0)	6.0 (3.0-10.0)	**<0.001**
Profession*			
Nurse	40 (50.0%)	11 (13.8%)	**<0.001**
Doctor	37 (46.2%)	15 (18.8%)	
Other Health Staff	3 (3.8%)	54 (67.4%)	
Shift*			
-No	0 (0.0%)	60 (75.0%)	**<0.001**
-Yes	80 (100.0%)	20 (25.0%)	
Number of staff who are on-call***	(n=80) 5.0 (0.0-9.0)	(n=20) 2.0 (0.0-3.0)	**<0.001**

Pearson chi-square/Fisher Exact test, Mann-Whitney U test, Student-t test *n(%), ** mean ± standard deviation, *** median (minimum-maximum)

The average score of all SF-36 quality of life questionnaire sub-field groups was significantly higher in the control group than in the group who stand duty ($p<0.05$). The general health level was better in the control group (Table 2).

Table 2. Results of SF-36 Questionnaire in Study and Control Group

Sub-field groups of the SF-36 (0-100)	Study group (n=80)		Control group (n=80)		P-value
	Median (min-max)	Mean ± sd	Median (min-max)	Mean ± sd	
Physical function	55.0 (0.0-100.0)	59.38±25.64	90.0 (15.0-100.0)	82.50±19.71	<0.001
Physical role difficulty	25.0 (0.0-100.0)	35.00±38.89	75.0 (0.0-100.0)	68.44±33.93	<0.001
General health	52.0 (15.0-92.0)	53.05±14.04	52.0 (25.0-87.0)	56.91±12.13	0.015
Vitality	50.0 (15.0-80.0)	52.63±13.80	60.0 (35.0-85.0)	61.31±11.16	<0.001
Social function	62.5 (12.5-100.0)	56.09±20.48	75.0 (12.5-100.0)	72.97±19.02	<0.001
Emotional role difficulty	0.0 (0.0-100.0)	27.5±39.61	100.0 (0.0-100.0)	67.5±41.07	<0.001
Mental health	56.0 (16.0-84.0)	56.30±10.93	64.0 (44.0-84.0)	62.70±9.67	<0.001
Ache	41.5 (10.0-100.0)	48.74±23.49	74.0 (12.0-100.0)	74.75±23.95	<0.001

Mann-Whitney U test

A significant difference was found in SF-36 subgroups in cases with FM (N:39) compared to cases with non-FM (N:141) ($p<0.05$). General health status was more negatively affected in the cases with FM (Table 3).

Table 3. Results of SF-36 subgroups with and without FM

Sub-field groups of the SF-36 (0-100)	Individuals without FM (n=128)		Individuals with FM (n=31)		P-value
	Median (min-max)	Mean ± sd	Median (min-max)	Mean ± sd	
Physical function	85.0 (0.0-100.0)	75.35±24.25	50.0 (5.0-100.0)	53.06±23.65	<0.001
Physical role difficulty	75.0 (0.0-100.0)	57.03±39.80	25.0 (0.0-100.0)	31.45±34.14	0.003
General health	52.0 (25.0-92.0)	56.63±13.20	47.0 (15.0-72.0)	48.26±11.40	0.001
Vitality	60.0 (15.0-85.0)	59.38±12.34	45.0 (15.0-75.0)	47.42±12.71	<0.001
Social function	62.5 (12.5-100.0)	68.75±19.59	50.0 (12.5-100.0)	47.18±20.59	<0.001
Emotional role difficulty	66.7 (0.0-100.0)	52.08±45.20	0.0 (0.0-100.0)	30.11±39.77	0.019
Mental health	60.0 (16.0-84.0)	60.69±11.12	56.0 (32.0-72.0)	54.58±7.77	0.004
Ache	64.0 (10.0-100.0)	67.27±25.87	41.0 (10.0-100.0)	38.84±18.99	<0.001

Mann-Whitney U test

The number of night shifts in the study group was 5.2 ± 1.2. It was found that the number of night shifts was 4.6 ± 2.2 in cases with FM and 2.6 ± 2.6 in cases with non-FM. The number of night shifts was significantly higher in cases with FM ($p <0.002$).

Table 4 shows the parameters with a significant relationship between FES and SF-36 criteria in FM patients. The inability to work parameters in FES showed a statistically significant relationship with most SF-36 subgroups.

Table 4. Correlation coefficients (p-values) of FES and SF-36 subgroups in patients diagnosed with FM (n=31)

	Physical function	Physical role difficulty	General health	Vitality	Social function	Emotional role difficulty	Mental health
FES1.1 (Shopping)	0.333 (0.068)	-0.016 (0.933)	0.185 (0.320)	-0.283 (0.122)	0.103 (0.582)	0.196 (0.290)	-0.201 (0.279)
FES1.2 (Washing clothes)	-0.025 (0.892)	0.004 (0.984)	0.172 (0.354)	-0.110 (0.556)	**0.349 (0.054)**	0.024 (0.898)	-0.272 (0.138)
FES1.3 (Food preparing)	-0.184 (0.322)	-0.117 (0.532)	**-0.420 (0.019)**	0.138 (0.460)	0.142 (0.446)	-0.185 (0.320)	0.078 (0.675)
FES1.4 (Hand Washing Dishes)	-0.160 (0.391)	0.061 (0.744)	**-0.372 (0.040)**	-0.065 (0.726)	0.011 (0.951)	-0.131 (0.481)	-0.126 (0.501)
FES1.5 (Sweeping the carpet with a vacuum cleaner)	-0.197 (0.289)	-0.156 (0.401)	-0.199 (0.284)	-0.017 (0.929)	0.087 (0.643)	-0.240 (0.193)	-0.123 (0.510)
FES1.6 (Arranging the beds)	0.270 (0.142)	-0.117 (0.530)	0.221 (0.232)	-0.034 (0.855)	**0.360 (0.047)**	0 094 (0.616)	-0.169 (0.364)
FES1.7 (Walking 200-300 mt)	0.167 (0.369)	-0.030 (0.872)	0.250 (0.175)	0.117 (0.532)	0.333 (0.067)	0.051 (0.787)	0.272 (0.139)
FES1.8 (Visiting friends/relatives)	0.328 (0.071)	-0.121 (0.518)	0.140 (0.453)	-0.254 (0.168)	0.200 (0.280)	0.211 (0.254)	-0.162 (0.384)
FES1.9 (Doing gardening)	0.101 (0.588)	-0.320 (0.079)	-0.087 (0.642)	**-0.345 (0.057)**	-0.026 (0.890)	-0.054 (0.772)	-0.138 (0.458)
FES1.10 (A) (Driving)	0.313 (0.086)	-0.156 (0.401)	0.249 (0.177)	-0.272 (0.139)	-0.097 (0.605)	0.165 (0.376)	-0.007 (0.970)
FES1.11 (M) (Climbing Upstairs)	**0.349 (0.054)**	-0.002 (0.993)	**0.371 (0.040)**	0.187 (0.314)	0.241 (0.191)	0.138 (0.458)	0.241 (0.191)
FES2 (Feeling well)	-0.304 (0.096)	0.101 (0.590)	-0.324 (0.075)	-0.238 (0.197)	**-0.403 (0.024)**	-0.049 (0.795)	-0.237 (0.200)
FES3 (Becoming unable to work)	**0.358 (0.048)**	**0.428 (0.016)**	**0.488 (0.005)**	0.221 (0.232)	0.085 (0.649)	**0.443 (0.013)**	0.231 (0.212)

FES4 (Pain)	0.210 (0.257)	-0.068 (0.717)	0.335 (0.065)	0.247 (0.180)	0.311 (0.089)	-0.079 (0.671)	**0.401 (0.025)**
FES5 (Pain level)	0.120 (0.522)	-0.199 (0.282)	0.256 (0.164)	0.274 (0.136)	0.301 (0.100)	-0.232 (0.209)	**0.562 (0.001)**
FES6 (Fatigue)	-0.027 (0.886)	-0.194 (0.295)	-0.047 (0.801)	0.261 (0.156)	0.184 (0.322)	-0.317 (0.082)	**0.443 (0.013)**
FES7 (How does she/he feel when she/he gets up in the morning)	0.309 (0.090)	-0.146 (0.433)	0.328 (0.071)	0.302 (0.099)	0.240 (0.193)	-0.123 (0.510)	**0.541 (0.002)**
FES8 (How much is morning stiffness)	**0.353 (0.051)**	-0.013 (0.943)	**0.481 (0.006)**	0.141 (0.449)	0.275 (0.134)	0.117 (0.529)	0.330 (0.070)
FES9 (How angry and tense she/he feels)	0.275 (0.135)	-0.070 (0.709)	**0.438 (0.014)**	**0.358 (0.048)**	0.252 (0.171)	0.110 (0.557)	**0.572 (0.001)**
FES10 (How sad, down, down, or depressed she/he feels)	0.150 (0.420)	0.002 (0.993)	0.174 (0.350)	0.050 (0.790)	-0.028 (0.883)	0.195 (0.293)	0.245 (0.184)

Spearman Correlation Coefficient

Ex. There is a weakly positive linear relationship (borderline significant) between FES1.2 (laundry) and "social function" (r=0.349, p=0.054).

There is a moderately negative linear relationship between FES1.3 (preparing meals) and “general health” (r=- 0.420, p=0.019)

Discussion

The cause of FM is not known with certainty. Circadian rhythm may play a role in etiology due to its central effects in musculoskeletal complaints. In people with circadian or biological rhythm disorders, muscle pain increases. In the etiology of FM, it is suggested that there is a hypersensitivity disorder in central sensitization. In this context, conditions that disrupt the circadian or biological rhythm may cause FM. This relationship has not been adequately explored in the literature. The ones on night shifts pose a risk group in terms of biological rhythm disorder. In this study, the frequency of FM was examined, and attention was drawn to the relationship between the healthcare workers.

The main symptom of FM is widespread chronic pain. It is accepted that the chronic pain process that starts with central sensitization explains the pain mechanism in this syndrome [14]. Central sensitization, which is the first step in chronic pain, is that CNS over-responds to painful stimuli due to hyperexcitability and hypersensitivity in CNS neurons (primary neurons), pain response to stimuli that do not arouse pain in the periphery is seen, and pain is continuous [14].

In our study, the number of shifts was greater in cases with fibromyalgia. As the number of painful points increased, it was found that the number of night shifts increased. The study of the biological clock in FM etiopathogenesis is scarce. Circadian rhythm may play a role in etiopathogenesis with central effects. The relationship between circadian rhythm and the neurovegetative system can be seen as widespread pain and accompanying symptoms in muscles in the periphery. In the study of Ardekani et al., it was found that anxiety, restlessness, and depression were more common in individuals working in shift work and night shifts [15].

Similar to our study, Samaha et al. reported that somatic symptoms such as headache and back pain accompany chronic fatigue complaints in individuals working at night, leading to physical insufficiencies [16]. In their study [17], Ergüney et al. reported that 76.7% of the nurses had malaise and fatigue, 56.8% of them had joint and leg pains, 55.1% of them had insomnia complaints, and 81.8% of them had fatigue due to the way of working; on the other hand, Zverev and Misiri [18] reported that shift work adversely affected sleep quality and the effects of night shift caused fatigue the next day.

In our study, SF-36 and FES criterion values were significantly higher in shift and FM workers. This finding suggests that FM affects general health status and functionality level. The presence of FM directly affects the professional performance, motivation, and work efficiency of the workers. Taking into consideration the negative effects of shift work on productivity, motivation, and occupational satisfaction, a widespread pain disorder such as FM will have more negative effects.

In these cases, breaking the cause (shift) of FM etiopathogenesis and the vicious cycle that starts with mutual interaction will increase the success of medical treatment. To provide optimal benefit in treatment, treatment approaches, which take into consideration the symptom severity, variety, and functional status of the patient, include psychosocial and behavioral methods and educational practices and in which pharmacological and nonpharmacological treatment methods are combined, are required [19,20].

Exercise and behavioral therapies, which are nonpharmacological treatment methods aimed at increasing the patient's physical functions and activity level and improving general health status, are frequently applied in the treatment of FM [21]. Behavioral therapies that have been used to treat chronic pain have become one of the most widely used methods in FM and are recommended as a first-choice treatment method in most of the guidelines [19,23,24,25,26]. Different approaches, such as analgesic and muscle relaxant drugs, physical therapy applications, exercise, spa treatments, and biofeedback, are used to treat FMS [27].

Original characteristics of our study: Questionnaires and physical examinations were directly performed by physicians. Algometry was used as an objective diagnostic tool in the diagnosis. This is because it is made only for on-call healthcare workers. There are very few published studies in this field. The control group was selected from the same center.

In shift workers, biological rhythm disorder leads to FM. It has a negative effect on people's functional and clinical conditions. Biological rhythm is an up-to-date subject, and studies in this area have increased in recent years.

Behavioral treatment approaches and improvement of environmental factors will increase clinical success.

Limitations of our study: It was cross-sectional, and no prospective follow-up was conducted. It is only made in a single center, and there are no simultaneous data in different centers.

Conclusion

Fibromyalgia is seen more frequently in healthcare workers who work night shifts and have at least 4-night shifts per month, and it affects the quality of life and general health status negatively. Compared to the control group, this situation becomes more apparent. The number of patients admitted to the physician with complaints related to fibromyalgia table is not less than the number of primary healthcare institutions. Considering that fibromyalgia is an essential factor negatively affecting the quality of life and causing loss of labor force, the importance of decreasing the shift work orders emerges in terms of preventive medicine in the social dimension.

When we evaluate this result in terms of preventive medicine, the importance of making arrangements to prevent FM will be understood better, considering the fact that FM, which negatively affects the quality of life, is a complex and long-lasting treatment. In this context, the number and intensity of night shifts per person should be minimized as much as possible to reduce the potential negative impact of night shifts on workers, especially in the lines of work where a shift work order negatively affects the human biological clock.

Conflict of interest: We declare no conflict of interest between the authors, third parties, or institutions.

Contributions of the authors:

Study Conception and Design	FÖ, ZÜ, ŞY, ÖE
Acquisition of Data	ŞY, ÖE
Analysis and Interpretation of Data	FÖ, ZÜ, ŞY, ÖE
Drafting of Manuscript	ŞY, ÖE, FÖ
Critical Revision	FÖ, ZÜ

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